

Long, et al. v. Tennessee Valley Authority, et al.
Case No. 3:09-cv-00114

**Addendum to Defendant Tennessee Valley Authority's Memorandum in Opposition
to Plaintiffs' Emergency Motion for Preliminary Injunction**
(Volume I)

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February 20, 2009

Mr. Leslie Sims
On-Scene Coordinator
U.S. Environmental Protection Agency, Region 4
61 Forsyth Street, SW, 11th Floor
Atlanta, Georgia 30303

**Subject: Final Comprehensive Environmental Response, Compensation, and Liability Act
(CERCLA) Emergency Response Report, Revision 0
Kingston Fossil Plant Fly Ash Response
Harriman, Roane County, Tennessee
EPA Contract No. EP-W-05-054
TDD No. TTEMI-05-001-0084**

Dear Mr. Sims:

The Tetra Tech EM Inc. (Tetra Tech) Superfund Technical Assessment and Response Team (START) is submitting the final emergency response report for the Kingston Fossil Plant Fly Ash Response site in Harriman, Roane County, Tennessee. The report summarizes field activities conducted at the site during the response.

If you have any questions about the enclosed report, please call me at (678) 775-3106 or Andrew Johnson at (678) 775-3100.

Sincerely,

A handwritten signature in black ink, appearing to read 'Paul E. Prys II'.

Paul E. Prys II
START III Project Manager

A handwritten signature in black ink, appearing to read 'Andrew F. Johnson'.

Andrew F. Johnson
START III Program Manager

Enclosure

cc: Katrina Jones, EPA Project Officer
Darryl Walker, EPA Alternate Project Officer
Angel Reed, START III Document Control Coordinator

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**FINAL CERCLA EMERGENCY RESPONSE REPORT
KINGSTON FOSSIL PLANT FLY ASH RESPONSE
HARRIMAN, ROANE COUNTY, TENNESSEE
EPA CONTRACT NO. EP-W-05-054
TDD NO. TTEMI-05-001-0084**

Revision 0

Prepared for

**U.S. ENVIRONMENTAL PROTECTION AGENCY
Region 4, Emergency Response and Removal Branch
61 Forsyth Street, SW, 11th Floor
Atlanta, GA 30303**

Prepared by

**Tetra Tech EM Inc.
Superfund Technical Assessment and Response Team Region 4
1955 Evergreen Blvd., Building 200, Suite 300
Duluth, GA 30096**



Contract No.	:	EP-W-05-054
TDD No.	:	TTEMI-05-001-0084
Date Prepared	:	February 11, 2009
EPA OSC	:	Mr. Leslie Sims
Telephone No.	:	(404) 562-8892
START III Project Manager:	:	Paul E. Prys II
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Prepared by

Paul E. Prys II
START III Project Manager

Reviewed by

Yuen Chang (Didi) Fung
START III Technical Reviewer

Approved by

Andrew F. Johnson
START III Program Manager

1.0 INTRODUCTION

This report has been prepared under the provisions of Technical Direction Document (TDD) No. TTEMI-05-001-0084, which the U.S. Environmental Protection Agency (EPA) Region 4 assigned to the Tetra Tech EM Inc. (Tetra Tech) Superfund Technical Assessment and Response Team (START) under Contract No. EP-W-05-054. The overall scope of this TDD, which is monitored by On-Scene Coordinator (OSC) Mr. Leslie Sims, was to support the Kingston Fossil Plant Fly Ash Response in Harriman, Roane County, Tennessee. Specific elements of this TDD included providing personnel, equipment, supplies, and services necessary to respond to a release of fly ash and possibly oil from a sluice pond into the Emory River; preparing a health and safety plan; coordinating sampling with the task monitor; conducting air monitoring; conducting multi-media sampling; providing data analysis and management; providing laboratory services; preparing written and photographic documentation of emergency response activities; and preparing a draft and final report upon completion of response activities.

This Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) emergency response report presents the site background (Section 2.0); discusses emergency response activities, including air monitoring and multi-media sampling objectives and results (Section 3.0); and provides a summary and conclusions (Section 4.0). Appendix A of this report provides figures that illustrate the site location, layout, and various activities of response. Appendix B presents a table summarizing the sampling conducted by Tetra Tech START and EPA during the response. Appendix C presents a photographic log of response activities and site conditions. Appendix D provides a project response timeline. Appendix E provides the logbook notes recorded to document the response. Appendix F provides validated analytical result tables and supporting data validation reports. Appendix G provides a table of witnesses associated with the response. Attachment 1 provides the Level 2 laboratory data packages for the samples analyzed. Attachment 2 provides the EPA, Science and Ecosystem Support Division (SESD), Site Investigation Report, TVA-Kingston Plant, Project Identification Number 09-0175, dated January 9, 2009.

2.0 SITE BACKGROUND

On December 22, 2008, at approximately 0100 hours, a failure of the northeastern dike used to contain fly ash occurred at the dewatering area of the Tennessee Valley Authority (TVA) Kingston Fossil Plant, located at 714 Swan Pond Road in Harriman, Roane County, Tennessee. The geographic coordinates for

the site are latitude 35.898304⁰ north and longitude -84.520570⁰ west (see Figure 1 in Appendix A). Subsequent to the dike failure, approximately 5.4 million cubic yards of fly ash sludge was released into a branch of the Emory River, two Emory River sloughs, eventually spilling into the main Emory River channel. The release extended approximately 300 acres outside of the fly ash dewatering and storage areas of the plant. Local emergency officials first responded to the scene, and then shortly thereafter, began to assist residents affected by the flows of fly ash sludge. Three residential homes were condemned as a result of damage sustained during the release.

Also on December 22, 2008, the National Response Center (NRC), and subsequently EPA Region 4, was notified of the incident. OSC Sims and Tetra Tech START were mobilized to the Kingston Fossil Plant facility the same day.

Fly ash is derived from the combustion of coal for power generation and represents the lightest and finest of all ash produced in this process. Fly ash is carried aloft by the escaping combustion gasses and would historically “fly” out of the stacks into the atmosphere — hence its name. Today, pollution control equipment is used to remove the ash from the exhaust. Fly ash is mainly silicon dioxide, aluminum dioxide, and iron oxide. Combustion rates in modern facilities are nearly 100 percent, which concentrates the levels of other potentially harmful adjunct contaminants in the ash, particularly metals such as arsenic, beryllium, boron, cadmium, chromium, chromium VI, cobalt, lead, manganese, mercury, molybdenum, selenium, strontium, thallium, and vanadium. The ash is then mixed with water which creates a sludge that is transported to large dewatering basins. Once it has been dewatered, much of the ash is sold for useful purposes, mainly as filler in Portland cement. The American Coal Ash Association estimates 43 percent of all fly ash generated in the country is used in this way. The remainder is generally placed in landfills.

3.0 EMERGENCY RESPONSE ACTION ACTIVITIES

3.1 RESPONSE OVERSIGHT ACTIVITIES

As requested by EPA, Tetra Tech START provided technical assistance during response activities at the Kingston Fossil Plant fly ash response site from December 22, 2008, through January 10, 2009. On January 11, 2009, EPA transferred the role of lead federal agency to TVA and demobilized all remaining personnel and equipment from the site.

On December 22, 2008, Tetra Tech START mobilized to the site and met with representatives from EPA and TVA. TVA had initiated spill response cleanup by mobilizing large numbers of heavy equipment (backhoes, amphibious backhoes, bull dozers, dump trucks, and related equipment) and personnel to clear and repair affected roadways and rail lines necessary to plant operations. The heavy equipment was also used to clear waterways to allow creeks to drain that had been blocked by the fly ash release. Barges were used to bring in riprap to install a weir to slow the flow of ash downstream. Booms were placed in the Emory and Clinch Rivers to contain cenospheres that migrated downstream. Cenospheres are small, hollow ceramic spheres of varying chemical constituency generated during high-efficiency coal combustion at thermal power plants. They are much less dense than water and float easily. Contractors were employed to vacuum the cenospheres and clean up debris along the waterways. TVA restored gas and water supplies to affected residents. In addition, TVA sampled air, soil, and water throughout the cleanup. Additional information on TVA's activities at the Kingston Fossil Plant fly ash release can be found at TVA's website: <http://www.tva.gov/kingston/index.htm>.

3.2 FIELD MONITORING AND SAMPLING ACTIVITIES

Tetra Tech was tasked by EPA to collect multimedia samples and conduct particulate air monitoring during the response at the Kingston TVA Fossil Plant. These activities were performed to provide data necessary to evaluate the initial and ongoing environmental impact of the fly ash release.

3.2.1 SURFACE WATER SAMPLING ACTIVITIES

Between December 23, 2008, and January 2, 2009, Tetra Tech START was tasked by the EPA to collect surface water samples from potentially affected waterways. Tetra Tech START collected 23 surface water samples, three duplicate samples, and two background samples along an approximately 10-mile stretch of the Emory, Clinch, and Tennessee Rivers. Some surface water samples were collected in areas where cenospheres were visible just downstream from the release area.

3.2.1.1 SURFACE WATER SAMPLING OBJECTIVES AND COMPARISON CRITERIA

The purpose of the sampling was to provide an initial characterization of the natural waters that may have been environmentally impacted by the release of fly ash into the Emory River and to evaluate how these characterizations changed during the timeframe of this response. At the request of the Tennessee Department of Environmental Conservation (TDEC), the analytical results were compared with the Tennessee Water Quality Criteria (TWQC) for Domestic Water Supply (Rule 1200-4-3-.03), located at



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
SAM NUNN ATLANTA FEDERAL CENTER
61 FORSYTH STREET, S.W.
ATLANTA, GEORGIA 30303

Memorandum

January 10, 2009

To: Tim Hope, TVA Incident Commander
Tennessee Valley Authority (TVA) Kingston Ash Release
Harriman, Roane County, Tennessee

From: Steve Spurlin, Federal On-Scene Coordinator
U.S. Environmental Protection Agency, Region 4

Re: Transfer of Federal Lead Agency Authority

On December 22, 2008, at approximately 0100 hours, the northeastern dike at the TVA Kingston Power Plant, located in Harriman, Roane County, Tennessee, failed. The dike retained one of three cells at the facility used for dewatering fly ash. Subsequently, approximately 5.4 million cubic yards of fly ash were released into two sloughs which flow into the Emory River. The release extended approximately 300 acres outside of the ash storage areas. Local emergency officials first responded to the scene, and then shortly thereafter, began to assist residents affected by the fly ash flow.

On December 22, 2008, the National Response Center (NRC), and subsequently the U.S. Environmental Protection Agency (EPA) Region 4, was notified of the incident. A Federal On-Scene Coordinator (OSC) responded to the TVA Kingston Power Plant Facility the same day.

TVA and EPA, as well as State and local agencies, have operated in a unified command during the emergency phase of the incident with EPA acting as the lead federal agency for environmental response. A decision was made by the Unified Command that the incident would transition from the emergency phase to long-term recovery effective January 11, 2009 at 1800 hrs.

Effective January 11, 2009, 1800 hrs, EPA transfers the lead federal agency role to TVA. If you have any technical questions or concerns, you may reach me at 731-394-8996. If you have to contact USEPA R4 pertaining to interagency issues, please contact Franklin E. Hill, Superfund Director, at 404-562-8599.



STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION

Office of General Counsel
401 Church Street
20th Floor, L & C Tower
Nashville, TN 37243-1548
Telephone: (615) 532-0131
Facsimile: (615) 532-0145

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
RECEIPT NO. 7005 1160 0004 7332 4834

January 12, 2009

Tom Kilgore, CEO
Tennessee Valley Authority
400 Summit Hill Drive
Knoxville, TN 37902-1499

Re: Commissioner's Order, Case No. OGC09-0001
In the Matter of: Tennessee Valley Authority

Dear Mr. Kilgore:

Enclosed please find an Order issued by Commissioner James H. Fyke on behalf of the Tennessee Department of Environment and Conservation in the above referenced matter. Please read it carefully and pay special attention to the NOTICE OF RIGHTS section.

Sincerely,

A handwritten signature in cursive script that reads "David Henry".

David Henry
Assistant General Counsel

Enclosure

Cc: Knoxville Field Office
Patrick Parker, WPC
Alfreda Freeman, EPA Water Management Division

**TENNESSEE DEPARTMENT OF ENVIRONMENT AND
CONSERVATION**

IN THE MATTER OF:)	DIVISION OF WATER
)	POLLUTION
)	CONTROL
TENNESSEE VALLEY)	
AUTHORITY)	
)	CASE NO. OGC09-0001
)	

ORDER

NOW COMES James H. Fyke, Commissioner of the Tennessee Department of Environment and Conservation, and states:

PARTIES

I.

James H. Fyke is the duly appointed Commissioner of the Tennessee Department of Environment and Conservation (the "Department").

II.

The Tennessee Valley Authority (hereinafter "Respondent" or "TVA") is a governmental entity with facilities throughout the State of Tennessee. Service of process may be made on Tom Kilgore CEO at 400 Summit Hill Drive, Knoxville, TN, 37902-1499

JURISDICTION

III.

Whenever the Commissioner, with the concurrence of the Governor, finds that an emergency exists imperatively requiring immediate action to protect the public health, safety, or welfare, or the health of animals, fish, or aquatic life, or a public water supply, or recreational, commercial, industrial, agricultural, or other reasonable uses, the Commissioner may, without prior notice, issue an order reciting the existence of such an emergency and requiring that such action be taken as the Commissioner deems necessary to meet the emergency, pursuant to Tennessee Code Annotated § 69-3-109(b)(1), the Water Quality Control Act, (the "Act"). Further, if the violator fails to respond or is unable to respond to the Commissioner's Order, the Commissioner has authority to take such emergency action as the Commissioner deems necessary, or contract with a qualified person or persons to carry out the emergency measures. The Commissioner may assess the person or persons responsible for the emergency condition for actual costs incurred by the Commissioner in meeting the emergency, pursuant to T.C.A. § 69-3-109(b)(2) of the Act.

IV.

"Waters of the State" are defined by T.C.A. §69-3-103(33). Pursuant to T.C.A. § 69-3-105(a)(1), all waters of the state have been classified by the Tennessee Water Quality Control Board for suitable uses. Department Rule 1200-4-4, "*Use Classifications for Surface Waters, et al*", is contained in the *Official Compilation of Rules and Regulations for the State of Tennessee*. Accordingly, the Emory River, Clinch River and Tennessee River are waters of the state. The Emory River, Clinch River and the Tennessee River have been classified for the

following uses: domestic water supply, industrial water supply, fish and aquatic life, recreation, irrigation, livestock watering and wildlife, and navigation.

V.

Notwithstanding the fact that TVA is a federal entity, TVA is subject to the jurisdiction of the Water Quality Control Act because sovereign immunity has been waived by Congress in regard to the activities addressed in this Order by the Clean Water Act (33 U.S.C. §1323); and, in addition, the Clean Air Act (42 U.S.C. §7418), and the Resource Conservation and Recovery Act (42 U.S.C. §6961). Further, by having applied for and received permits under the Solid Waste Disposal Control Act and the Water Quality Control Act, as stated herein, TVA has acknowledged that its activities in regard to fly ash are subject to the requirements of these laws.

FACTS

VI.

Kingston Fossil Plant is located at the confluence of the Emory and Clinch Rivers near Kingston, Tennessee. It is one of TVA's larger fossil plants. In approximately 1958 this facility began use of a 244 acre settling pond for ash containment. This settling pond covered the area where the current Settling Pond, Stilling Pond and Landfill Cells 1, 2, 3 & 4 now reside

VII.

Fly ash is the residue from burning coal that is collected from the air pollution control equipment at the plant -- specifically, the electrostatic precipitators. In layman's terms, this is the material that makes the smoke black

(i.e., the dark colored particulates that comes out of the stack). Bottom ash is the residue collected in the bottom of the boiler after combustion of coal.

VIII.

The Environmental Protection Agency ("EPA") issued TVA National Pollutant Discharge Elimination System Permit #TN0005452 (hereinafter "NPDES permit") permit on April 30, 1976. In 1986, TVA constructed artificial wetlands to treat seepage from the dike along the southern portion of the ash pond. This was in response to an EPA order that cited TVA for the unpermitted discharge of this material.

IX.

On September 1, 2003, the Department's Water Pollution Control Division (WPC) issued TVA its most recent NPDES permit for the Kingston facility. The permit authorizes discharge of water from the ash settling pond to the plant intake channel (the intake draws water from the Emory River) and discharge of cooling water to the Clinch River downstream from the mouth of the Emory River. The permit requires that a certain amount of free water volume be maintained in the ash pond to provide adequate treatment prior to discharge. This requirement necessitates periodic dredging of the ash settling pond.

X.

In 1995, TVA submitted a closure plan for the settling pond to the Department's Solid Waste Management Division (SWM). At this time, the

dredge cells were considered by TVA to be part of the settling pond since they were contained within the dikes of the pond. When TVA submitted the settling pond closure plan to SWM, the plan identified the year 2015 as the date for the actual closure of the settling pond. This raised permitting issues relevant to the long term regulation and management of the settling pond. SWM took the position that the activity proposed by TVA was the operation of a landfill, rather than simply the closure of the settling pond. Eventually TVA agreed and on June 29, 1999, TVA modified the settling pond closure application, changing it into an application for a Class II landfill for the disposal of the ash waste. SWM issued TVA the requested Class II landfill permit on September 26, 2000.

XI.

On December 22, 2008, containment structures surrounding portions of the Class II landfill failed. This resulted in a catastrophic release of coal ash sludge to the environment. The ash slide disrupted power, ruptured a gas line, caused one home to be knocked off its foundation and damaged others. Swan Pond Road and a local railroad track were covered and blocked by the ash flow. The ash inundated waters of the state including but not limited to two inlets of the Emory River.

XII.

Emergency management efforts began immediately and are on-going. TVA continues to manage the flow of the Clinch and Tennessee Rivers to minimize the possibility of water from the plant entering into the Kingston water supply intake. A sediment catchment dam now extends approximately 150 ft into

the Emory River. Barges have been brought in to retrieve trees and other debris caused by the ash flow. TVA police continue to assist local law enforcement with maintaining security for the homes in the affected area. An EPA contractor performed a reconnaissance in the affected area to determine the feasibility of implementing an ash sampling plan. Samples of the ash pile were taken. EPA's contractor also continues to monitor the progress of removal activities on Swan Pond Road and the railroad.

ORDER

XIII.

WHEREFORE, after consideration of the foregoing and with the concurrence of the Governor, I, James H. Fyke, pursuant to the authority vested by T.C.A. §69-3-109(b), have found that an emergency exists imperatively requiring immediate action to protect the public health, safety, or welfare, or the health of animals, fish, or aquatic life, or a public water supply, or recreational, commercial, industrial, agricultural, or other reasonable uses, do hereby **ORDER that:**

1. The Respondent shall continue to implement measures to (a) prevent the movement of contaminated materials into waters of the state, and (b) where feasible, minimize further down-stream migration of contaminated sediments. Respondent shall prevent access by the public to any areas that it owns that pose any health or safety hazard to the public.
2. Respondent shall fully cooperate with and provide support for the Department's comprehensive review of all TVA coal ash impoundments located

within the State of Tennessee. This review shall include but not be limited to a thorough assessment of the structural integrity of all of TVA's coal ash impoundments by independent professional engineers, environmental management professionals, or other experts deemed qualified by the Department.

3. Within 20 days after the receipt of this Order, the Respondent shall submit to the Department all existing studies, reports and memoranda that are potentially relevant to explaining or analyzing the cause of the catastrophic failure of the containment structures surrounding portions of its Kingston Class II landfill. This shall include, but not be limited to, all structural integrity analyses, engineering studies, results of previous investigations, any documents that discuss the potential for failure of the containment structures surrounding the Kingston Class II landfill and any documents that recommend limiting the use of the landfill due to structural problems and water levels within the landfill. To the extent possible this information shall be submitted to the Department in an electronic format that is word and term searchable.

4. Respondent shall fully cooperate with and provide support for the Department's initial assessment of the impact of the ash release on all waters of the state, including the reservoir, its tributaries, wetlands, and groundwater. The assessment shall include, but not be limited to, (a) the current extent of contaminated sediments, (b) present impacts to fish and aquatic life, (c) a projection of future transport and distribution of contaminated sediments, (d) a projection of the duration and severity of future impacts to waters of the states,

and (e) any safety hazard posed by the ash to workers or the public through inhalation, ingestion, or engulfment.

5. Within 45 days after the receipt of this Order, the Respondent shall prepare and submit to the Department a Corrective Action Plan ("CAP"). The CAP shall include:

- A. a plan for the comprehensive assessment of soil, surface water, and ground water; remediation of impacted media; and, restoration of all natural resources damaged as a result of the coal ash release;
- B. a plan for monitoring the air and water in the area during the cleanup process;
- C. a plan to ensure that public and private water supplies are protected from contamination and that alternative water supplies are provided if contamination is detected,
- D. a plan addressing both the short term and long term management of coal ash at the Kingston Plant, including remediation and stabilization of the failed ash waste cells, proper management of the recovered ash, and a revised closure plan for the Class II ash disposal facility; and,
- E. a plan to address any health or safety hazards posed by the ash to workers and the public.

6. Following a review of the CAP and all background information, the Department will schedule a meeting which the Respondent shall attend. The

Respondent shall furnish or bring with it to this meeting all data, information,

reports, and/or records that the Department specifies when scheduling this meeting. At this meeting, the Department will specify any revisions to the CAP that are deemed to be necessary.

7. Upon approval by the Department, the Respondent shall implement the CAP according to the schedule approved by the Department.

8. The Respondent shall submit to the Department all data that is obtained during implementation of the CAP. Following receipt and evaluation of this information, the Department will schedule an assessment conference which the Respondent shall attend (the Department may elect to conduct this conference by telephone, in this case the Respondent is required to participate). The purpose of this conference will be to discuss existing data and determine any reasonable and necessary further investigation, remedial action, and/or long term monitoring and maintenance.

9. If at or following this conference the Department determines that additional investigation, remedial action and/or long term monitoring and maintenance is reasonable and necessary, the Respondent will submit, as the Department may direct, a plan(s) for performing the additional activities.

10. Upon approval by the Department, the Respondent shall implement this plan(s) according to the schedule approved by the Department.

11. The Respondent shall submit to the Department a written report describing the performance and results of any additional work required pursuant to paragraph 10 above. Following receipt and evaluation of this report, the Department will

schedule a conference, which the Respondent must attend. The purpose of this

conference is to discuss the work performance and results and determine what, if any, additional work must be performed.

12. The activities specified in paragraphs 9, 10, and 11 will be repeated until no longer deemed necessary by the Department.

13. After each submittal required of the Respondent pursuant to this Order, the Department will review that submittal to determine whether, in the opinion of the Department, it is adequate. If the Department determines that it is not adequate, the Department will, after consultation with the Respondent, either (i) require the Respondent to amend the submittal to correct deficiencies specified by the Department, or (ii) revise the submittal to correct the deficiencies.

14. The Respondent may request a time extension for any deadline included in this Order or in Plans approved pursuant to this Order prior to the deadline. The time extension may be granted by the Commissioner for good cause shown.

15. The Respondent shall pay all costs associated with the Department's investigation of the ash release and oversight of the implementation of this Order. These costs shall include, but are not limited to, mileage, lab expense, salary, benefit and administrative costs for the Department's employees and other state employees actively employed in oversight of work under this Order or investigation of the ash release (including preparation for and attendance at meetings), and the current State overhead rate. Oversight costs also include expenditures for office space and related expenses in the vicinity of the ash release, services contracted for by the Department that facilitate or support the

Department's investigation of the ash release and oversight of work under this

Order, including but not limited to, the review of plans and reports submitted by TVA pursuant to this Order, and for the independent inspection and review of the structural integrity of all TVA coal ash impoundments located within the State of Tennessee. The Department shall provide the Respondent with periodic statements reflecting oversight costs incurred. Within sixty (60) days of the receipt of each such statement, the Respondents shall pay to the Department the amount invoiced.

16. At any time deemed necessary by the Department, the Department may schedule an assessment conference that the Respondent shall attend.

17. All information, reports, or studies submitted by the Respondent to the Department under the terms of this Order shall contain the following notarized statement:

I certify under penalty of law, including but not limited to penalties for perjury, that the information contained in this document and on any attachment is true, accurate and complete to the best of my knowledge, information and belief. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for intentional violation.

18. Upon completion of all tasks set forth in this Order, the Department shall issue to the Respondent a letter stating the requirements of this Order have been fulfilled and no further action of the Respondent is required under this Order.

RESERVATION OF RIGHTS

This Order addresses corrective action for the emergency situation that currently exists. This Order does not in any way relieve TVA of obligations imposed by the Tennessee Water Quality Control Act, or any other State or Federal law. The issuance of this Order shall not be deemed an election by the department to forego any civil or criminal action to seek penalties, fines, or other appropriate relief under the Act, or any other law. The department expressly reserves the right to issue further Orders under the Water Quality Control Act or other laws to require further or different corrective action based on changes of conditions or new information, to assess civil penalties for all violations of the law, and to assess all damages allowed by law.

NOTICE OF RIGHTS

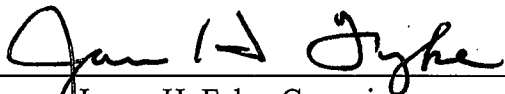
Tennessee Code Annotated §§69-3-109 and 69-3-110 require the Respondent to comply immediately with this Order. The same laws also allow the Respondent to secure review (appeal) of this Order. To do so, a written petition setting forth the grounds (reasons) for requesting a hearing before the Water Quality Control Board must be RECEIVED by the Department within THIRTY (30) DAYS of the date the Respondent received this Order or it will become final (not subject to review). If a petition for a hearing is filed, the law also requires that it be held within three days from its receipt by the Board.

Artificial Respondents (corporations, limited partnerships, limited liability companies, etc.) cannot engage in the practice of law. They may secure review (appeal) before the Water Quality Control Board only through an attorney licensed to practice law in Tennessee. Natural Respondents may represent themselves or be represented by an attorney licensed to practice law in Tennessee. Low-income individuals may be eligible for representation at no cost or reduced cost through a local bar association or legal aid organization.

Any hearing of this case before the Board will be a contested case hearing governed by T.C.A. § 4-5-301 *et seq.* (the Uniform Administrative Procedures Act) and the Department of State's Uniform Rules of Procedure for Hearing Contested Cases before State Administrative Agencies. Such hearings are in the nature of a trial before the Board sitting with an Administrative Law Judge. The Respondent may subpoena witnesses to testify.

At the conclusion of a hearing the Board has the authority to affirm, modify, or deny the Emergency Order. Furthermore, the Board has the authority to assess damages incurred by the Department including, but not limited to, all docketing expenses associated with the setting of the matter for a hearing and the hourly fees incurred due to the presence of an administrative law judge and a court reporter.

Issued by the Commissioner of the Tennessee Department of Environment
and Conservation on this 12th day of January, 2009.

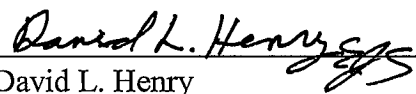

James H. Fyke, Commissioner
Department of Environment and
Conservation

Any petition for review (appeal) must be directed to David Henry,
Assistant General Counsel, Department of Environment and Conservation, 401
Church Street, 20th Floor L&C Tower, Nashville, Tennessee 37243-1548. The
case number should be written on all correspondence regarding this matter.

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing has been
served upon the Respondent by sending a true and correct copy of same by U.S.
certified mail, return receipt requested, postage prepaid.

This the 12th day of January, 2009.


David L. Henry
Assistant General Counsel
Department of Environment & Conservation
401 Church Street, L&C Tower 20th Floor
Nashville, Tennessee 37243-1548



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

February 4, 2009

Tom Kilgore, CEO
Tennessee Valley Authority
400 Summit Hill Drive
Knoxville, Tennessee 37902-1499

Dear Mr. Kilgore:

As the cleanup of the Kingston fly ash incident moves from the emergency response phase towards the long-term recovery phase, the Environmental Protection Agency (EPA), Region 4, and the Tennessee Department of Environment and Conservation (TDEC) want to express their commitment to working collaboratively in their oversight of cleanup activities. As your agency, EPA and TDEC recognize, there are various state and federal requirements that apply to the cleanup of ash from the Kingston site, the ultimate disposal of the recovered material and the restoration of impacted waters. A coordinated oversight approach is critical to ensuring that the objectives of both state and federal regulatory authorities are achieved so that we can realize our common goal of protecting human health and the environment.

TDEC's Commissioner's Order, issued to TVA on January 12, 2009, requires the submittal of a Corrective Action Plan to TDEC for addressing the cleanup of the ash spill. In addition to other federal authorities that incidents like the Kingston spill trigger, when EPA finds that an Executive agency is in violation of a pollution control standard, Executive Order 12088 states that, upon notice of such violation from EPA, the Executive agency shall provide to EPA a plan to achieve and maintain compliance with the applicable pollution control standard. Without limiting any other authorities that EPA might later choose to exercise with respect to this incident, EPA is hereby providing notice to TVA pursuant to Executive Order 12088 that EPA considers the Kingston spill to be an unpermitted discharge of a pollutant in contravention of the Clean Water Act.

In order to meet the requirements of both the TDEC's Commissioner's Order and Executive Order 12088, and to ensure the most efficient and expeditious collaboration between our three agencies, please provide duplicate copies of all plans, reports, work proposals and other submittals to EPA and TDEC simultaneously. Our two Agencies will then coordinate our review and approval of such submittals within our respective authorities. To that end, our Agencies will identify applicable cleanup standards and other standards of control and will work together to resolve any discrepancies that might exist between federal and state requirements. Please continue to provide submissions to TDEC in accordance with the direction you previously received from Joe Sanders, General Counsel for TDEC, by email dated January 20, 2009. Submittals to EPA should be made to Mr. Tom Welborn, of EPA's Water Protection Division, at 61 Forsyth Street SW., Atlanta, GA 30303-8960 or Welborn.Tom@epa.gov.

Internet Address (URL) • <http://www.epa.gov>

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TDEC and EPA look forward to working with TVA to restoring the Emory River and surrounding area. Please feel free to contact us if you have any questions or concerns.

Sincerely,



A. Stanley Meiburg
Acting Regional Administrator
EPA Region 4



Paul Sloan
Deputy Commissioner
Tennessee Department of Environment
and Conservation

**Phase 1 Emory River Dredging Plan
Kingston Fossil Plant Ash Recovery Project**

**Tennessee Department of Environment and Conservation
Commissioner's Order, Case No. OGC09-0001**

**Tennessee Valley Authority
Kingston Fossil Plant**

Contract No. 00028244-00014

Prepared by:

**Shaw Environmental, Inc.
312 Director's Drive
Knoxville, Tennessee 37923**

February 2009

1.0 Phase 1 Dredging Plan Scope and Objectives

Shaw Environmental, Inc. (Shaw) has been contracted by the Tennessee Valley Authority (TVA) to prepare a Dredging Plan for ash released into the Emory River, Roane County, Tennessee. Shaw will execute Work Order 00028244-00014, issued on January 27, 2009, for Emergency Response services at the TVA Kingston Fossil Plant (KIF).

1.1 Objectives of the Phase 1 Dredging Plan

The Phase 1 Dredging Plan provides the methods and objectives for dredging operations in the Emory River to remove ash and debris in the main channel and focus on getting the original Emory River channel reopened for flow. Currently, part of the river channel is blocked by ash and the river is diverting around the blockage. The dredging of the Emory River will be accomplished in the following phases:

- Phase 1 dredging is to clear the Emory River channel to a design elevation of 710 feet mean sea level (msl) to restore flow to the channel, to minimize flooding, and to prevent further migration of the ash. This phase also will include dredging to assist in safe removal of debris associated with the collapse of the skimmer wall and to re-establish a flow pathway for cold water from the Clinch River to the KIF intake channel.
- Phase 2 dredging is to dredge the remaining ash within the river channel while minimizing disturbance of legacy, native sediments.
- Phase 3 dredging is to remove ash deposits that are outside of the Emory River channel.

In Phase 1 dredging, the river channel will be cleared to a design elevation of 710 feet msl (NGVD 1929) using hydraulic dredging with mechanical debris removal. As part of Phase 1, the recently constructed underwater weir (referred to as Weir 1) will be lowered to the depth of the dredge cut. Ash also will be removed from the debris field from the skimmer wall collapse to allow divers to work in that area in debris assessment and removal. Dredging to the depth of 710 feet msl will restore flow to the original channel without disturbing legacy, native river sediments. Ash recovery, disposal, and water treatment will be addressed under a separate plan to be provided by TVA.

Future work not addressed in this plan includes Phase 2 dredging that will focus on returning the river channel back to its original depths while minimizing disturbance of legacy sediment. Additionally, Phase 2 will include removing Weir 1 completely. Both channel clearing and weir

removal are on-water operations. Proposed future work not addressed in this plan includes Phase 3 dredging that will focus on removal of ash deposits outside of the Emory River channel.

During dredging operations the ash is disturbed and some dredged material is re-suspended in the water column and not captured by the dredge. Turbidity will increase in the immediate area of the dredging. Control practices and monitoring are presented in this plan to minimize suspended solids re-suspension during the dredging operations. Best management practices (BMPs) will be developed as part of this plan to minimize impacts to the river. BMPs could include operational controls (i.e., reduce cutterhead speed, reduce rate of advance, reverse cutterhead rotation) and/or engineering controls (i.e., turbidity curtains).

Water quality monitoring procedures are presented as part of this plan. TVA will continue to collect routine water samples (e.g., metals, hardness, pH, temperature) from various sampling locations as described in the sampling plan provided to the Tennessee Department of Environment and Conservation (TDEC). In addition, TVA and/or its contractors will collect additional field data upstream and downstream of the dredging/removal operations to characterize mobilization of particulate from dredging activities. This additional sampling is described in Section 4.3.

1.2 Scope of Work

The scope of the Emory River Phase 1 Dredging Plan is to accomplish the following:

- Develop a Dredging Plan to provide the methods and quality criteria for the Phase 1 river dredging.
- Develop dredging methods that will clear the impacted river channel to an elevation of 710 feet msl primarily utilizing hydraulic dredging and limited mechanical dredging/debris removal.
- Dredge the Emory River to restore flow in the channel without further impacting legacy, native river sediment.
- Describe BMPs to control effects on water quality from dredging operations.
- Develop a plan that will provide surveys and monitoring to be performed to confirm that project objectives and regulatory criteria have been met.
- Provide guidance for sampling, monitoring, and analysis of river water during dredging operations in the Emory River.
- Develop a Health and Safety Accident Prevention Plan for dredging operations.

1.3 Organization of the Dredging Plan

The Phase 1 Dredging Plan describes the work elements for the dredging of the Emory River that are required to open the main river channel for flow and flood control. The plan provides the basic proposed methods for conducting the work, monitoring the completion of the work and monitoring the water quality during dredging operations. Management of ash and water discharge from dredging operations will be provided in a separate document.

Organization of the Phase I Dredging Plan is as follows:

Section 1: Plan Scope and Objectives

Section 2: Site Background

Section 3: Phase 1 Dredging Methods

Section 4: Construction Quality Monitoring Plan

Section 5: Water Quality Monitoring Plan

1.4 Project Organization

TVA (and/or its contractor(s)) will be responsible for the dredging operations and implementation of sampling and monitoring activities during dredging. TVA or its contractor will share the monitoring and analytical results with the Tennessee Department Environment and Conservation (TDEC) and the Environmental Protection Agency (EPA).

Key Personnel:

- Tim Hope—TVA Kingston Ash Recovery Project Manager
- John Moebes—Jacobs Kingston Ash Recovery Project Manager
- Neil Carriker—TVA Environmental Project Manager
- Cynthia Anderson—TVA Environmental Compliance and Liaison with TDEC, EPA, and other regulators
- Rob Crawford—TVA Sampling and Monitoring Coordinator
- Jonathan Walker – TVA Field Crew Coordinator
- Bill Rogers—TVA Data Management and Verification

1.5 Project Schedule

The project schedule for the Phase 1 Emory River dredging plan preparation, dredging plan regulatory review, and dredging operations is provided on the following page.

Activity ID		Activity Description	Orig Dur	Rem Dur	%	Early Start	Early Finish	2009 JAN 19 26 2 9 16 23 2 9 16 23 30 6 13 20 27 4 11 18 25 1 8 15 22 FEB MAR APR MAY JUN																												
KIF Ash Recovery Project																																				
Dredging Plan																																				
KR1000		Prepare Draft Dredging Plan-Ash Processing Area	2	0	100	24JAN09A	25JAN09A	<div>▲ Prepare Draft Dredging Plan-Ash Processing Area</div>																												
KR1010		Int. Rvw Draft Dredging Plan-Ash Processing Area	2	0	100	25JAN09A	26JAN09A	<div>▲ Int. Rvw Draft Dredging Plan-Ash Processing Area</div>																												
KR1030		EPA Provide Sampling Procedure	4	0	100	25JAN09A	28JAN09A	<div>▲ EPA Provide Sampling Procedure</div>																												
KR1020		Final Dredging Plan-Ash Processing Area Int Rvw	3	0	100	26JAN09A	29JAN09A	<div>▲ Final Dredging Plan-Ash Processing Area Int Rvw</div>																												
KR1050		Int Rvw Draft Sampling Plan-Ash Proc. Area Compl	0	0	100		30JAN09A	<div>◆ Int Rvw Draft Sampling Plan-Ash Proc. Area Compl</div>																												
KR1060		Mtg w/TDEC/EPA/CORP on Plans-Ash Proc. Area	1	0	100	05FEB09A	05FEB09A	<div>▲ Mtg w/TDEC/EPA/CORP on Plans-Ash Proc. Area</div>																												
KR1270		TVA Re-submit Plan to TDEC/EPA/CORP	1	1	0	25FEB09*	25FEB09	<div>▲ TVA Re-submit Plan to TDEC/EPA/CORP</div>																												
KR1070		Appr'l from TDEC/EPA/CORP on Plans	0	0	0		02MAR09	<div>◆ Appr'l from TDEC/EPA/CORP on Plans</div>																												
Regulatory Review																																				
KR1080		Dredge Plan for TDEC/EPA/CORP Review	5	0	100	05FEB09A	13FEB09A	<div>▲ Dredge Plan for TDEC/EPA/CORP Review</div>																												
KR1230		Temp Ash Stg Plan for TDEC/EPA/CORP Review	5	0	100	05FEB09A	13FEB09A	<div>▲ Temp Ash Stg Plan for TDEC/EPA/CORP Review</div>																												
Ash Processing Area																																				
KR1240		Clear & Grub	7	0	100	04FEB09A	11FEB09A	<div>▲ Clear & Grub</div>																												
KR1250		Install Rock & Fabric Liner - Ash Recovery Area	37	30	19	11FEB09A	19MAR09	<div>▲ Install Rock & Fabric Liner - Ash Recovery Area</div>																												
KR1260		Instl Rock & Fabric Liner - Temp Ash Storage	59	45	24	11FEB09A	10APR09	<div>▲ Instl Rock & Fabric Liner - Temp Ash Stor</div>																												
Phase I Dredging Operations																																				
KR1110		Mobilize Dredge #1	12	0	100	02FEB09A	13FEB09A	<div>▲ Mobilize Dredge #1</div>																												
KR1120		Installation of Turbidity Control BMPs by TVA	15	15	0	02MAR09*	16MAR09	<div>▲ Installation of Turbidity Control BMPs by TVA</div>																												
KR1130		Begin Dredging Activities - Piping & Rim Ditch	18	18	0	02MAR09	19MAR09	<div>▲ Begin Dredging Activities - Piping & Rim Ditch</div>																												
KR1140		Start Dredging from River - Segment 1	0	0	0	20MAR09		<div>◆ Start Dredging from River - Segment 1</div>																												

Start Date
24JAN09
Finish Date
20JUN09
Data Date
18FEB09
Run Date
25FEB09 11:16

▲ Early Bar

▲ Progress Bar

▲ Critical Activity

KIFR

Tennessee Valley Authority
KIF Ash Recovery Project

Sheet 1 of 1

Date

Revision

Checked

Approved

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2.0 Site Background

This section provides background information for the Kingston Fossil Plant (KIF) and the Emory River. Figure 1 shows the location of KIF in the vicinity of Kingston, Tennessee and the Emory and Clinch Rivers.

2.1 Description of the Area and Location

The KIF is located at the confluence of the Emory and Clinch Rivers on Watts Bar Reservoir near Kingston, Tennessee. Kingston is one of TVA's larger fossil plants. It generates 10 billion kilowatt-hours of electricity a year, enough to supply the needs of about 670,000 homes in the Tennessee Valley. Plant construction began in 1951 and was completed in 1955. Kingston has nine coal-fired generating units. The winter net dependable generating capacity is 1,456 megawatts. The plant consumes some 14,000 tons of coal a day.

The KIF is located on the Emory River arm of Watts Bar Reservoir, which feeds into the Clinch River (Figure 2). The Emory River borders the KIF ash cells to the east. The Emory River rises on the Cumberland Plateau in Morgan County, Tennessee and crosses into Roane County near Harriman, Tennessee. Flow on the Emory River in the vicinity of KIF is not controlled upstream by flood control or navigation structures. The river elevation is controlled by Watts Bar Dam located downstream of KIF. Summer pool elevation for the Emory River at KIF is approximately 740 to 741 feet msl and winter pool elevation is 735 to 740 feet msl based on Watts Bar headwater. The Watts Bar annual spring reservoir fill period is from March 15 to May 15. The Emory River typical flow volume in the winter and spring ranges from 500 to 50,000 cubic feet per second (CFS). The 10 year flood flow rate is anticipated to be 110,000 CFS and at an estimated flow rate of 12 feet per second. Dredging will only occur during flow conditions that minimize migration of ash and do not cause the downstream turbidity to be 200 NTU or greater than the background turbidity (see Section 4.3.1). Emory River flow data can be found at the following site: <http://waterdata.usgs.gov>.

2.2 Description of the Ash Release

On Monday, December 22, 2008, just before 1 a.m., a coal fly ash spill occurred at TVA's Kingston Fossil Plant, allowing a large amount of fly ash to escape into the adjacent waters of the Emory River. Ash, a by-product of a coal-fired power plant, is stored in containment areas. Failure of the dredge cell dike caused about 60 acres of ash in the 84-acre containment area to be displaced. At the time of the slide, the area contained about 9.4 million cubic yards of ash. The dike failure released about 5.4 million cubic yards (cy) of coal ash that now covers about 275 acres (Figures 3 and 4).

Fly ash filled the Swan Pond Embayment on the north side of the KIF property adjacent to the failed dredge cell. A dike is being constructed in the eastern portion of the Swan Pond Embayment to contain the fly ash to the west of the dike until a remedial action plan is developed, approved by the regulators, and implemented. Fly ash also entered the channel and overbank areas of the riverine section of the Emory River. TVA is planning to recover the material outside of the Swan Pond Embayment by use of dredging operations.

The fly ash that was released to the Emory River originates from the coal burned in boilers for power production at KIF. The coal, in its natural state, contains various metals that can be retained with the ash after burning. The ash itself is primarily composed of fine silica particles very similar to sand. Trace amounts of arsenic, selenium, cadmium, boron, thallium, and other metals which occur naturally in the coal remain in the ash after coal combustion. These metals are typically bound to the ash.

The U.S. Coast Guard issued an advisory that the Emory River is not navigable from mile marker zero through mile marker 4. Work is complete on an underwater rock weir (Weir 1) built in the Emory River, just north of the existing plant intake skimmer wall. Weir 1 will allow water to continue flowing and retain the ash at the bottom of the river channel. Weir 1 is about 615 feet long. Figure 5 shows the known thickness of ash in the Emory River.

3.0 Phase 1 Dredging Operation

The Phase 1 dredging operation includes four major components, along with a monitoring component. These four major components include:

- Mobilization and site preparation, including erosion control features for the processing area
- Dredging (including installation of controls to minimize mobilization of material)
- Hydraulic dredge material dewatering and material handling
- Demobilization and site restoration

The objectives of Phase 1 dredging are two fold. One objective is to remove the ash from the Emory River while not disturbing the native sediments. The second is to restore the Emory River navigation channel flow to an elevation of 710 feet msl. This will be accomplished by using conventional dredging equipment and methods to remove the ash and debris down to a nominal elevation of 710 feet msl. The original boundaries of the Emory River channel are depicted within the yellow lines on Figure 6. The horizontal limits of the Phase 1 dredging will occur for most part within the boundaries of the Emory River channel, except where ash and debris pose a navigation hazard outside of the channel boundaries.

3.1 Mobilization and Site Preparation

The dredging contractor will mobilize to the Phase 1 Project site and prepare the upland staging area for the Project. In general, mobilization and site preparation activities include the following:

- Installation of erosion control features on the material processing site
- Clearing and grubbing, grading, and surfacing of the staging area
- Delivery of the heavy equipment including excavators, dozers, loaders, forklifts, pumps, and tanks (as required)
- Delivery and installation of office, break, storage, and tool trailers (as required)
- Delivery of all remaining equipment
- Final dewatering and ash processing area construction
- Installation of ash pond or other processing pond controls (as needed)
- Installation of turbidity monitoring system in dredged area

- Identification of lay down areas for equipment
- Launch of marine equipment into Project area

The overall site plan showing the dewatering and ash processing areas for Phase 1 of the Project is shown on Figure 8. The processing and staging areas will be adjusted and/or added as necessary as the dredging proceeds.

The entire dewatering and processing areas will be sloped to drain into the existing plant Ash Pond. High density polyethylene pipe (HDPE) will convey the dredged material from the dredge overland to the dredge sluice channel constructed beside the existing plant fly ash and bottom ash channel. In the event of a dredge effluent overflow or a line rupture, the dredged material will drain into the Ash Pond. All recovered water from the dredged material will be conveyed to the Ash Pond via constructed channels. The Ash Pond discharges directly into the plant intake channel via a diffuser. The controls to be used at the ash pond are described in Section 5.3.

All work performed and equipment utilized will conform to the Environmental Health and Safety Plan. All marine equipment including hydraulic dredges, mechanical dredge equipment on barges, debris barges and work boats will conform to the Project Marine Safety and Transportation Plan.

3.2 Dredging

The Phase 1 dredging operation will be segmented in a manner to minimize the continuing downstream migration of ash material and debris and to maximize the immediate effect of the dredging. The Phase 1 dredging segments are delineated on Figure 6. The proposed order of Phase 1 dredging segments are:

- Segment 1 – approximately 2,994 feet long by 600 feet wide directly east of the ash spill event running north-south along the Emory River navigation channel.
- Segment 2 – approximately 650 feet long by 600 feet wide immediately south or downstream of Segment 1 also running north-south along the Emory River navigation channel up to Weir 1 or Segment 3.
- Segment 4 – approximately one mile long by 500 feet wide running northwest to southeast along the Emory River navigation channel immediately south or downstream of Segment 3.
- Segment 3 – Weir 1 partial removal to elevation 710 msl.
- Segment 5 – approximately 3,050 feet long by 600 feet wide running northeast to southwest along the Emory River navigation channel immediately north or upstream of Segment 1.

3.2.1 Segment 1

To minimize the downstream migration of ash and siltation due to the dredging, the Phase 1 dredging operation will begin on the northern-most block of Segment 1. The dredging will process the first block from north to south. The exception maybe the need for the dredge to dredge a single pass from the south (downstream) to north (upstream) end of Segment 1 to reach the starting end of Segment 1.

Segment 1 will be dredged from east to west at approximately 60-foot wide passes starting at the north end of Segment 1. Each pass will be limited to a depth of no more than five feet per pass. The underwater side slopes of each pass are expected to be sloped at 10 horizontal to 1 vertical. East-west passes moving downstream will stair-step so that no adjacent pass is more than five feet deeper than its contiguous downstream dredge prism. The dredge prisms for Segment 1 are shown on Figure 7. Movement of the ash, if any, due to the dredging will be into the dredge area.

Upon satisfactory completion of the first east-west row, the dredging will then process the next row immediately to the south of the first block. This pattern will continue until the entire channel is satisfactorily dredged to 710 feet msl from north to south.

A "Pilot" dredging program will begin in Segment 1 and will continue for the first 60-days. After completion of the Pilot, the dredging of Segment 1 and the other segments will continue at the sustainable pace determined in the Pilot.

3.2.2 Segment 2

Segment 2 will be dredged in the same block pattern as Segment 1 beginning at the northeasterly-most block. Phase 1 dredging in Segment 2 will begin either after the completion of the dredging for Segment 1 or concurrently based upon the availability of the dredging equipment and the ability to proceed safely and adequately handle the return water from the second dredge.

3.2.3 Segment 4

Additional surveys of the extent of ash in the Emory River in Segment 4 will determine the limit of Phase 1 dredging for ash above the 710 foot msl elevation. Segment 4 will be dredged in the same block pattern as Segment 1 and Segment 2 beginning at the northeastern most block. Phase 1 dredging in the northern section of Segment 4 will begin as soon as practical to remove ash and debris from the mouth of the KIF intake channel. This area must be cleared to replace the damaged skimmer wall for maintenance of summer plant operations, so this dredging may occur

concurrently with dredging of Segment 1. The rest of Segment 4 will be dredged after the completion of the dredging for Segment 1 and Segment 2.

3.2.4 Segment 3

Weir 1 will be lowered to 710 feet msl as part of Phase 1 dredging only after the satisfactory completion of Segment 1, Segment 2 and Segment 4.

3.2.5 Segment 5

Segment 5 will be dredged in the same block pattern as Segment 1 and Segment 2 beginning at the northeastern-most block. Phase 1 dredging in Segment 5 will begin after the completion of the dredging for Segment 1, Segment 2, and Segment 4 dredging or concurrently, based upon the availability of the dredging equipment and the ability to proceed safely and adequately handle the return water from the second dredge. Surveying will evaluate the extent of ash presence upstream to determine the appropriate end point for Segment 5 Phase 1 dredging.

3.3 Hydraulic Dredging

The primary equipment selected for the Phase 1 will be a hydraulic cutterhead swinging ladder or hydraulic swinging ladder dredge. For the Pilot, the dredge will be capable of moving at least 3000 in-situ cubic yards per day. The dredging will begin with a "Pilot" phase testing at the minimum capacity. After proof-of-process, the capacity will be selected for full-scale dredging. A single dredge or series of hydraulic cutterhead dredge(s) will be retained to dredge at the total operable dredge rate determined in the Pilot as sustainable on a continuous basis.

The dredge(s) will be capable of performing the work in a safe, orderly, and environmentally acceptable manner. The dredge(s) will be delivered to the Project site on over the road vehicles and launched from the KIF boat ramp. The dredge will meet the requirements defined in the Marine Safety and Transportation Plan.

The dredge will use a cutter head with variable speed operation and with a ladder that is long enough to reach a final depth of 30-feet. During the pilot a shallower depth will be allowed for the proof-of-process. The cutter head dredging will be positioned with a global positioning system (GPS) operated onboard in order to maintain dredging with the specified Project limits. The dredge discharge will be by HDPE pipe that is fusion welded in segments to convey the dredge discharge to the dewatering and processing area shown on Figure 8.

Unaffected areas in the Emory River navigation channel containing navigable depths will not be impaired except as allowed by applicable laws or regulations. Dredge discharge pipes in these areas may be submerged and at no time will the depth and width of the existing navigation

channel be reduced. Management of the dredge discharge lines will conform to appropriate Federal and State regulations. When the submerged line is placed in shallow water, outside the navigable channel, where the possibility exists for small outboard powered skiffs to cross over the submerged pipeline, the pipeline will be marked with fluorescent orange buoys and signs stating "DANGER SUBMERGED PIPELINE" every 150-feet throughout the length of the submerged pipeline.

Dredge discharge pipes that are floating or supported on trestles will display appropriate lights at night and in periods of restricted visibility in accordance with USCG regulation and "33 CFR 88.15." Floating discharge pipes are any pipelines that are not laid along the bottom and include rubber discharge hoses.

Ash processing capacity, discharge line capacity and water quality restrictions may vary the dredge rate during dredging operations. Additional pumping capacity or larger dredges will be added as required after the Pilot to convey the dredge discharge to the dewatering and processing areas shown on Figure 8. Flow meters will be utilized to monitor and record the dredge discharge conveyed to the processing area.

The hydraulic dredging will be staffed and operated 24 hours per day, 7 days per week. The dewatering and process equipment will also be staffed 24 hours per day, 7 days per week, as required to meet the needs of dredging. It is expected that the overall operation of the dredging, dewatering, and processing area will be approximately 20 hours of the 24 hour day. Light plants will be installed on land and on barges in the work area as necessary to provide lighting required for dredging work performed at night. If circumstances arise that would cause a change in the 24 hours per day, 7 days per week schedule, TVA will notify and coordinate with TDEC.

Targeted ash deposits from the Phase 1 dredging area will be removed using the number and capacity of dredges as determined possible during the Pilot. Since the Phase 1 goal is to reach approximately elevation 710, no effort will be made to complete a clean-up pass to adjust elevation of the bottom at the end of Phase 1.

Material encountered that is too large or too dense to be dredged hydraulically will be identified and the location recorded for subsequent removal by means of mechanical dredging/debris removal as described below. After the material has been removed by mechanical dredging these areas shall be inspected and re-dredged with the hydraulic dredge to insure the required depth is obtained.

3.4 Mechanical Dredging

It is anticipated that debris (e.g., trees, debris from demolished structures, boulders, large rocks, and any other dense or large objects that would hinder dredging operations) will be encountered within the Phase 1 Project area. At this time TVA cannot make a total assessment of the amount of debris that will be encountered or the extent of mechanical dredging in Phase 1. TVA will be prepared to use mechanical dredging as well as hydraulic dredging as appropriate. Mechanical dredging will be a 7-day week operation.

An excavator with a clam shell bucket on a barge will be used to perform debris removal activities. The clam shell bucket will allow ash and water to pass through the bucket while the oversized materials will remain in the bucket for removal. A specially designed rake and grapple may also be utilized as required during debris removal operations, depending upon the nature and size of the debris encountered. The debris will be transferred to an on-site debris processing area.

The floating silt curtain containment systems fastened to the crane barge will be deployed prior to initiation of mechanical dredging operations in all Phase 1 dredging areas. The top of the silt curtain will float with the curtain hanging in the water stopping the movement of suspended ash that has reached the surface from moving out of the immediate area that is being mechanically cleaned.

3.5 Hydraulic Dredge Material Dewatering and Material Handling

The hydraulic dredge material dewatering and material handling will be performed in the dewatering and processing areas on Figure 8. The extent and definition of this activity is outside the Phase 1 scope of the Project and is defined elsewhere. The material flow balance summary for managing dredged solids and water is included in Attachment 1 of this document.

3.6 Demobilization and Site Restoration

Upon completing all work for the Emory River dredging activities, the Project site will be demobilized. Demobilization will include the following:

- Removal of office, break, storage, and tool trailers
- Removal of all heavy equipment used for the Project
- Breakdown and removal of the dredge discharge piping, dredge traverse materials and any markers
- Removal all debris, trash, and garbage resulting from construction activities
- Site restoration

Site restoration activities will involve restoring all disturbed areas to conditions specified in the Solid Waste Closure Plan or “clean closure” conditions.

<p align="center">Table 2 Routine Surface Water Sampling Locations</p>							
Sample Number	Location	RM	Site Label	Sample Type	Depth (ft)	Latitude	Longitude
1	Clinch River	0.0	KIF-CRM0.0-Date	Grab	15	N35.86364	W84.53181
2	Clinch River	2.0	KIF-CRM2.0-Date	Grab	15	N35.88621	W84.52778
3	Clinch River	4.0	KIF-CRM4.0-Date	Grab	15	N35.88956	W84.49892
4	Clinch River	5.5	KIF-CRM5.5-Date	Grab	15	N35.89274	W84.48142
5	Emory River	0.1	KIF-ERM0.1-Date	Grab	15	N35.88986	W84.48778
6	Emory River	1.75	KIF-ERM1.75-Date	Grab	15	N35.90305	W84.49708
7	Emory River	2.1	KIF-ERM2.1-Date	Grab	mid-depth	N35.90925	W84.50055
8	Emory River	4.0	KIF-ERM4.0-Date	Grab	15	N35.92416	W84.48255
9	Emory River	12.2	KIF-ERM12.2-Date	Grab	0.5	N35.92899	W84.55450
10	Tennessee River	563.5	KIF-TRM563.5-Date	Grab	15	N35.83941	W84.58283
11	Tennessee River	568.5	KIF-TRM568.5-Date	Grab	15	N35.85539	W84.53068

<p align="center">Table 3 Requested Laboratory Analyses</p>					
Analysis	Method	Units	Container	Preservation Technique	Holding Time
Alkalinity	EPA 310.1/SM 2320B	mg/L	Poly	None	28 days
Dissolved Silica	EPA 200.7/200.8/6020	mg/L	Poly	Nitric Acid, < pH 2	6 months
Total and Dissolved Metals	EPA 200.7/200.8/6020	mg/L	Poly	Nitric Acid, < pH 2	6 months
Hardness	EPA 200.7/200.8/6020 SM 2340B	mg/L	Poly	Nitric Acid, < pH 2	6 months
Total and Dissolved Mercury	EPA 245.1	mg/L	Poly	Nitric Acid, < pH 2	28 days
Total Suspended Solids (TSS)	EPA 160.2/SM 2540D	mg/L	Poly	< 6° C	7 days
Total Dissolved Solids (TDS)	SM 2540C	mg/L	Poly	< 6° C	7 days

5.3 Material Dewatering Best Management Practices

Facility Ash Pond

TVA is planning to implement various best management practices for the return water from the ash processing area. Return water flow from the dredged material will be directed to the ash sluice channel that flows to the ash pond. This is similar to normal ash sluicing operations and it is expected that some ash will settle out in the channels in the ash processing area. A turbidity curtain will be deployed in the main ash pond as a baffle between the lateral expansion cell and the sluice channel discharge to reduce short circuiting and increase solids retention time. The curtain will be installed prior to commencing dredged material dewatering activities.

TVA will increase visual observations of the final stilling pond to daily, observing the pond for increased turbidity. TSS monitoring currently occurs on a monthly basis at the ash pond

discharge (IMP 001). During the first two weeks of dredging, TVA will increase TSS monitoring at IMP 001 to daily and require a 24-hour laboratory turnaround. The daily TSS monitoring will be evaluated at the end of the two week period and reduced to weekly if the data supports the change. Weekly monitoring of the TSS will continue for the duration of the dredging operations that provide dredge return water to the ash pond, or until a reliable data trend may be observed that does not violate NPDES permit limitations. This will be included with the Ash Release Program Administrator's (Environmental) or PA(E)'s inspection responsibilities.

Objectionable turbidity will be communicated to dredging personnel to investigate and/or consider additional BMPs or modification(s) to the dredge operation. The Ash Release PA(E)'s routine inspections will also include observations about collected cenospheres in the main ash pond and stilling pond. Notification to TVA's By-Products Marketing Staff for increased collection will be made if excessive cenospheres are observed.

TVA is also investigating the use of polymers for a variety of applications related to the release. There is a request for proposals being sent to certain water treatment vendors. Initial tests for efficacy and toxicity will be performed to determine the best product that may be used for this purpose in the ash pond to promote settling. TVA will continue to monitor free water volume in the ash pond to promote effective treatment.

TVA is investigating possible modifications to the frequency of sluicing ash to the ash pond. There may be other ash sluicing schedules from the routine handling of ash that can be used to avoid overwhelming the treatment capacity of the ash pond. (See Attachment 1 for material flow analysis information.) The presence of diffusers on the ash pond discharge pipes (except for the emergency overflow) will minimize the likelihood of objectionable color contrast in the receiving stream as the discharge is extremely well mixed.

Other Dredge Return Water Locations

TVA is also pursuing development of an area near the gypsum pond for handling dredged material and return water. If this area is also allowed by the Division of Solid Waste for ash processing, similar inspections of the discharge area would be conducted by the Ash Release PA(E).

5.4 Water Quality Results and Action Levels

As stated in section 4.3, if the downstream turbidity measurement is 200 NTU or greater than the background turbidity measurement over a twenty four-hour rolling average, dredging operations



STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
NASHVILLE, TENNESSEE 37243-0435

JAMES H. FYKE
COMMISSIONER

PHIL BREDESEN
GOVERNOR

March 2, 2009

Ms. Anda Ray
Senior Vice President
Environmental Permitting and Compliance
Tennessee Valley Authority
400 West Summit Hill Drive
Knoxville, TN 37902

Re: Phase 1 Emory River Dredging Plan and Ash Processing/Temporary Storage
Facility - Approval under Commissioner's Order OGC09-0001

Dear Ms. Ray:

Both of the subject plans were originally submitted to TDEC under letters dated February 4, 2009. Following review and comments by this department, EPA, the Corps of Engineers and other agencies, TVA resubmitted both plans for approval on February 25, 2009, by posting on the TVA web site.

After review of the resubmitted documents and upon consultation with EPA both plans are approved. However, prior to the actual commencement of dredging, TVA must submit, and TDEC and EPA must approve, a sampling plan for the dredging operation. These approvals are granted under the terms of Commissioner's Order OGC09-0001, Part XIII.

Sincerely,

A handwritten signature in black ink, appearing to read "Paul Sloan", is written over a horizontal line.

Paul Sloan
Deputy Commissioner

PLS:cm

Cc: Cynthia Anderson, TVA
Tom Welborn, EPA
Brad Bishop, USACOE
David McKinney, TWRA
Steve Alexander, USFWS
Paul Davis, TDEC
Chuck Head, TDEC